

and use by a particular application are visually highlighted in window 710 relative to data items that are not available to the particular application.

The generated display image also includes a prompt element 700 supporting user entry of an expression identification name and a window 725 indicating acceptable values, parameters and ranges of values and parameters for a data item selected via window 710. The generated display image further includes a window 726 permitting user selection from a set of expression operators available for inclusion in an expression entered by a user via prompt element 500. The set of expression operators available for inclusion is specifically associated with application interface 25 and application 30 in a similar fashion to the set data items in window 710. Icons 715 and 719 enable a user to initiate exit from the expression entry display menu of Figure 7 upon successful expression creation and storage or upon cancellation of use of the Figure 7 menu, respectively.

In step 407 of Figure 4, application 30 initiates display of a window (not shown to preserve clarity) including multiple template expressions available for user selection and inclusion in expression entry prompt element 500 (Figure 7). The set of template expressions available for inclusion is specifically associated with application interface 25 and application 30 in a similar fashion to the set data items of window 710 and the operators of window 726. Upon user selection of a particular template expression from multiple available displayed expressions the particular expression is included for user amendment and customization in prompt element 500 (Figure 7). In step 411, upon editing and amendment of the template expression to provide the user desired expression, the expression syntax is parsed and validated in response to user selection of icon 717 (Figure 7). If a syntax error is detected the user is notified by a displayed message indicating a syntax check failure and identifying particular elements or features of the entered expression that are unacceptable. An entered expression is deemed valid if the expression syntax is compatible with application 30 (and its software objects and procedures) used to process the expression. Upon successful validation, application 30 stores the expression in step 413 in response to user selection of icon 715 (Figure 7). Application 30 processes the stored expression in step 415 to provide a result in response to user selection of an icon in a user interface menu of application interface 25 of application 30. The process of Figure 4 terminates at step 420.

Figure 5 shows a diagram illustrating user interaction and navigation operation of application 30 and the application 25 user interface exemplified in Figure 6 and the expression entry user interface exemplified in Figure 7. A user selects a previously created expression by its name via element 526 in Figure 5 (also shown in

Figure 6). The selected expression is displayed in an expression creation menu exemplified in Figure 7 (specifically in item 500 of Figure 7) in response to user selection of icon 588 of Figure 5 (also shown in Figure 6). A user selects data items (command 507) to populate expression display element 500 via window 710. A user also selects (commands 508, 511 and 515) other items to populate the expression including allowable values via window 725, miscellaneous values via window 724 and operators via window 726. Allowable values in window 725 may be displayed for informational purposes or may be selectable by a user for inclusion in the expression depending on the parameter involved. Upon user selection of various items via commands 507, 508, 511 and 515, the selected items are included in the expression display element 500 via corresponding actions 517, 520, 527 and 529.

A user edits the populated expression in display element 500 to meet his requirements and upon completion of editing, selects an exit option (command 533). Exit options are initiated via user selection of icons 715, 717 or 719 (Figures 5 and 7). User selection of icon 717 initiates a syntax check of the expression which results in either successful validation of the expression or user notification of a syntax error by a displayed message. Similarly, user selection of icon 715 initiates a syntax check of the expression which also results in either successful validation notification to a user or user notification of a syntax error by a displayed message. However, successful expression syntax validation in response to selection of icon 715 also results in exit from the display menu of Figure 7. User selection of icon 719 results in discarding non-stored data and exit from the display menu of Figure 7. Following creation of an expression using the interaction and navigation procedure of Figure 5, the expression is available for processing by application 30 to provide a result in response to user selection of an icon in a user interface menu of application interface 25.

The architecture, user interfaces and processes presented in Figure 1-7 are not exclusive and may be adapted to accommodate different elements and properties. Other architectures and processes may also be derived in accordance with the principles of the invention to accomplish the same objectives. Further, the inventive principles may be incorporated into any language based applications not just JAVA or XML compatible applications. For this purpose a data dictionary may be readily provided including expression data items, operators and other predetermined elements associated with particular applications and application interfaces that may be used. Thereby avoiding the need to be constrained to use of JAVA type class files. Further, the inventive principles may be implemented in

JAVA code incorporated into a non-JAVA application capable of invoking the JAVA code and executing customer provided expression decision logic.

Description of Terms

JAVA - A simple, object-oriented, distributed, robust, secure architecture neutral, multithreaded language. Additional information is available at many sites, including <http://java.sun.com>.

Extensible Markup Language (XML) - this is an important Internet standard used to encode structured data passed between computer systems. The World Wide Web Consortium maintains this public standard. Additional information is available at <http://www.w3.org/XML>.

JAVACC - Java parser generator. Additional information is available at http://www.webgain.com/products/metamata/java_doc.html

2001P13207US01